WATER AVAILABILITY DETERMINATION IN SUBDIVISION REVIEW

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WPIC

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TOPICS

- **LEVEL OF DEQ ANALYSIS**
- **VARIATION OF WATER AVAILABILITY ANALYSIS**
- **VARIATION BETWEEN STATE AND CONTRACTED COUNTY REVIEW**

LEVEL OF ANALYSIS

- **ARM 17.36.330**
  - ***"Necessary quantity and quality of water must be available at all times unless depleted by emergencies."***
- **QUALITY**
- **QUANTITY**
- **DEPENDABILITY**

QUALITY

- **Quality - ARM 17.36.331**
  - **Cannot exceed human health standards in DEQ-7.**
  - **If human health standards are exceeded, can treat water to acceptable levels.**
  - **Typically just test for specific conductance, nitrate (as N), and total coliform bacteria (in existing water wells) unless indication of other pollutants.**

QUANTITY

- **Quantity - ARM 17.36.332(1)**
  - **Single Family System:**
    - ➢ **10 gpm for one hour; or**
    - ➢ **6 gpm for two hours; or**
    - ➢ **4 gpm for four hours**
  - **Shared System:**
    - ➢ **15 gpm for one hour; or**
    - ➢ **10 gpm for two hours**
  - **Multi-User / Public**
    - ➢ **DEQ-3 / DEQ-1**

QUANTITY

- Data used to demonstrate adequate flow:
  - Existing well logs
  - Existing published reports
  - Modeling
  - Pump tests
- Allow use of storage to meet quantity requirement:
  - Cistern
  - Storage in the well

DEPENDABILITY

- **ARM 17.36.332**
  - **"…At a minimum, the applicant shall provide evidence that the aquifer can supply, by itself or through recharge from surrounding geologic units, water to wells in an amount equal to the proposed ground water withdrawals". [ARM 17.36.332(6)]**
  - **Dependability is ability to use water in perpetuity from aquifer without "mining" the aquifer and possibly destroying the aquifer.**

DEPENDABILITY

- Most difficult criteria to demonstrate
- Methods to determine dependability:
  - Existing well logs and general knowledge of local hydrogeology
  - Published hydrogeological reports
  - Ground Water Modeling
  - Long-Term Pumping Tests (24-72 hours)
    - Drawdown
    - Recovery
    - Observation wells

DEPENDABILITY

- DEQ does not account for impacts to other existing wells
- Loss of irrigation recharge affecting future dependability can be assessed
- Irrigation is most significant consumptive use
  - ¼ of lawn irrigation uses about 0.67 ac-feet/year of diversion (irrigation rate of 1.5 inches/week)
- In-house domestic use has limited consumptive use.
- Bedrock aquifers difficult to review – typically assume they act like regular porous media

VARIATION OF WATER AVAILABILITY ANALYSIS

- **Amount of data required typically varies depending on:**
  - **Amount of water use proposed**
  - **Density of proposed development**
  - **Known water resource availability**
  - **Type of aquifer (bedrock vs. alluvial)**
  - **Surrounding density / water availability issues**

VARIATION BETWEEN STATE AND CONTRACTED COUNTY REVIEW

- **Can be variation between individual reviewers based on their technical expertise and knowledge of local conditions.**
- **DEQ encourages counties to request technical assistance from staff hydrogeologists**
- **DEQ provides trainings across the state to county reviewers and consultants.**

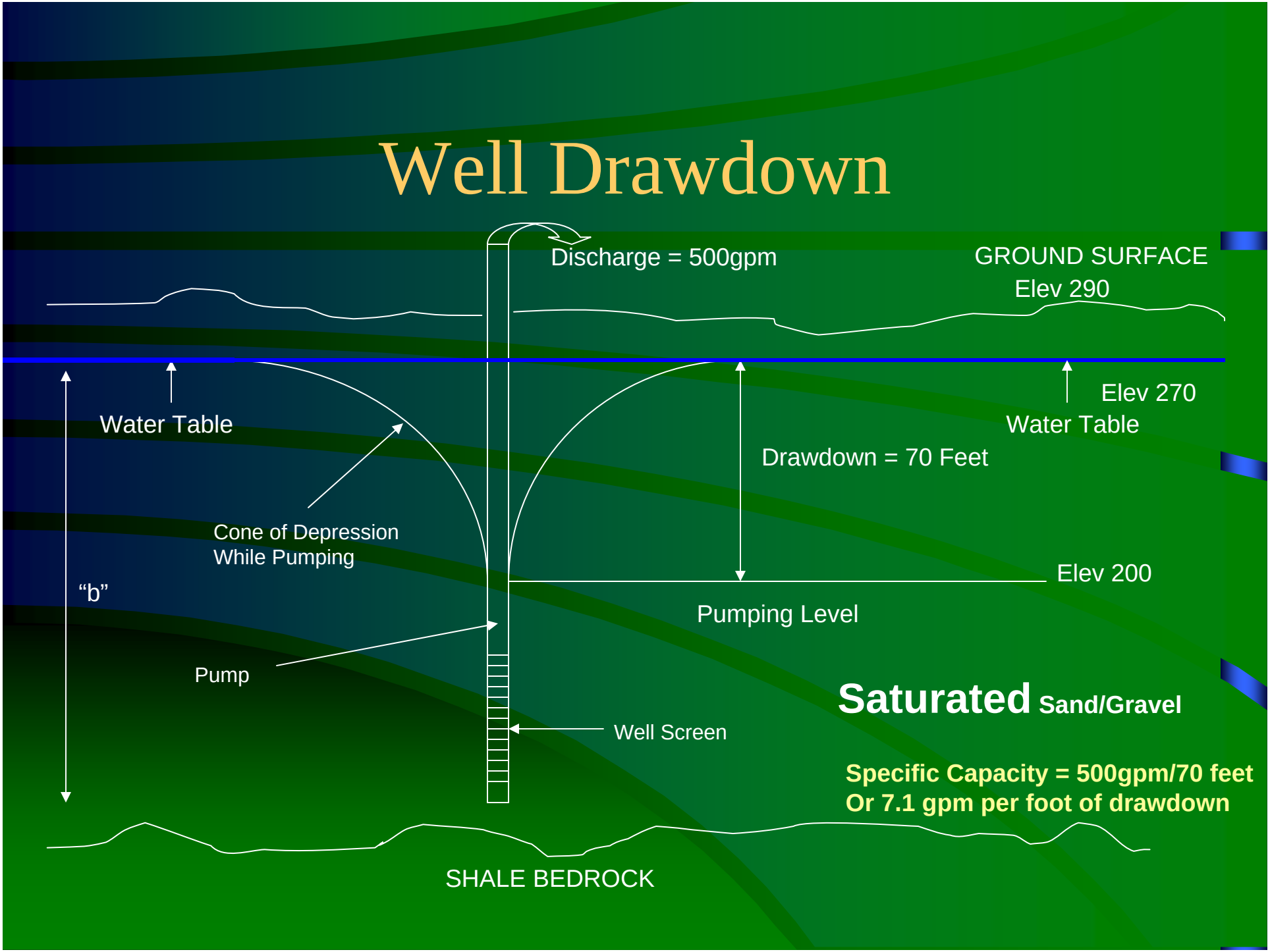
VARIATION BETWEEN STATE AND CONTRACTED COUNTY REVIEW

- **EXAMPLE**
  - **100 lot subdivision**
  - **Preliminary on-site pumping test data has evidence of very poor yielding and undependable aquifer**
  - **County would approve cisterns and wells on each lot.**
  - **Wells are at the risk of the lot owner**
  - **Rationale: homeowners drill wells even if not approved, this method at least allows county to place the wells in appropriate locations to maintain proper setbacks**

SUMMARY

- **DEQ must assure adequate water supply is available for the forseeable future**
- **DEQ doesn’t assess impacts to surrounding existing wells**
- **Detail of review varies depending on site specifics and on reviewer.**

Well Drawdown



Exempt Well Irrigation Diversion

Location	Year App.	Acres/lot	Annual Irr. Use (ac-ft)
Helena	2000	3.3	0.81
Billings	1994	0.5	0.78
Billings	Mid – 70's	1	1.6
Bozeman	Mid 80-90's	1	1.29
Missoula	1994	1.4	1.1
Missoula	2000	1	1.1